AMENDMENTS TO THE CLAIMS

1. (Canceled).

2. (Canceled).

3. (Currently Amended) The method of claim 19[[1]] wherein a set of free radicals formed to react with the ammonia are derived from nitrogen oxides, carbon monoxide, hydrocarbons, and water vapor.

4. (Canceled).

5. (Canceled).

6. (Canceled).

7. (Currently Amended) The method of claim 19[[1]] further comprising removing particulate matter from the gas stream prior to irradiating the gas stream to form the free radicals that react with the ammonia in the gas stream.

8. (Original) The method of claim 1 wherein the intensity of the irradiation falls in the range of 100-2,000 microwatts per square centimeter.

9. (Currently Amended) The method of claim 19[[1]] further comprising filtering particulate matter from the gas stream and providing a two stage irradiation process where one irradiation stage is employed prior to filtering the particulate matter and the second irradiation stage is employed after filtering the particulate matter.

10. (Canceled).

11. (Canceled).

12. (Original) A method of producing cement and removing ammonia from a gas stream produced, comprising:

a. directing a raw feed into a pyroprocessing system of a cement manufacturing facility, and heating the raw feed as the raw feed moves through the pyroprocessing system;

b. directing the heated raw feed through at least one kiln that forms a part of the pyroprocessing system to produce cement clinker;

c. heating the pyroprocessing system and directing the resulting gas stream through the pyroprocessing system; and

d. irradiating the gas stream with UV light and disassociating hydrogen atoms from ammonia within the gas stream to form NH_2, and reacting the NH_2 with NO_x to form N_2 and H_2O.

13. (Previously Presented) The method of claim 12 further comprising irradiating the gas stream with UV light in the spectral range of 230 to 370 nanometers.

14. (Previously Presented) The method of claim 12 further comprising removing particulate matter from the gas stream prior to the gas stream being subjected to the irradiation to form free radicals that react with the ammonia.

15. (Original) The method of claim 12 wherein the intensity of the irradiation falls in the range of 100-2000 microwatts per square centimeter.

16. (Previously Presented) The method of claim 12 further comprising filtering particulate matter from the gas stream and providing a two-stage irradiation process where one irradiation stage is employed prior to filtering the particulate matter and the second irradiation stage is employed after filtering the particulate matter.

17. (Previously Presented) The method of claim 12 wherein the disassociated hydrogen atoms form hydroperoxy free radicals that continue to initiate oxidation reactions with the ammonia.

18. (Previously Presented) The method of claim 12 wherein the disassociated hydrogen atoms form H_2O and hydroperoxy free radicals and wherein the hydroperoxy free radicals continue to initiate oxidation reactions with the ammonia.

19. (New) A method of removing ammonia from an effluent gas stream comprising:

a. irradiating a gas stream produced by an industrial process where the gas stream emitted from the industrial process contains ammonia at concentrations less than 40 ppm;

b. substantially reducing the concentration of the ammonia present in the gas stream emitted by the industrial process by irradiating the gas stream with UV light in the spectral range of 230 to 370 nanometers to cause the photolysis of nitrogen dioxide, ozone and hydrogen peroxide present and/or formed in the gas stream emitted by the industrial process;

c. initiating a set of hydroxyl and hydroperoxy free radical reactions that result in the removal of a hydrogen atom from the ammonia to form an NH_2 radical wherein the initiation of the free radical reaction is a result of irradiating the gas stream with the UV light in the spectral range of 230 to 370 nanometers; and

d. maintaining a NO_x concentration in the gas stream at a concentration level sufficient to maintain in the gas stream the active set of hydroxyl and hydroperoxy free radical reactions.

20. (New) The method of claim 12 including irradiating the gas stream with UV light in the spectral range of 230-370 nanometers.

21. (New) The method of claim 20 wherein the ammonia is present in the gas stream at concentrations less than 40 ppm, and wherein irradiating the gas stream with UV light in the spectral range of 230-370 nanometers causes the photolysis of nitrogen dioxide, ozone and hydrogen peroxide present and/or formed in the gas stream, and wherein the photolysis of nitrogen dioxide, ozone and hydrogen peroxide initiates a set of hydroxyl and hydroperoxy free

radical reactions that result in the removal of a hydrogen atom from ammonia to form an NH_2 radical.

22. (New) The method of claim 19 including reducing the concentration of the ammonia in the gas stream from an initial concentration of less than 40 ppm by at least 40%.

23. (New) The method of claim 19 wherein the hydroxyl and hydroperoxy free radical reactions results in the conversion of NO to NO_2, and wherein the ratio of the NO_2 concentration to the NO concentration is maintained at less than a value of 10 to ensure that the sum of NO and NO_2 is not reduced more than 50%, and to ensure that sufficient NO_2 and NO remain to sustain the free radical reactions that remove ammonia.